Before the

Federal Communications Commission

Washington, D.C. 20554

In the Matter of

REQUEST for WAIVER of Section 15.205(a) of the Commission's Rules to permit certification of Tank Level Probing Radar (TLPR) operating in the band 78-79 GHz and AMENDMENT of Part 15 to Establish regulations for TLPR in the Band 77-81 GHz	RM No. 11352 ET Docket No. 06-216

OHMART-VEGA COMMENTS TO

WAIVER REQUEST
AND
PETITION FOR RULEMAKING

FILED BY SIEMENS MILLTRONICS PROCESS INSTRUMENTS, INC.

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and

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SUMMARY

Siemens Milltronics Process Instruments Inc. filed on November 7, 2006 a request for waiver of Section 15.205(a) of the FCC Rules and Regulations to permit the certification and the immediate marketing of frequency modulated continuous wave (FMCW) tank level probing radar (TLPR) in the band 78-79 GHz for use in closed metal and reinforced concrete material storage tanks. Concurrently, Siemens filed a petition for rulemaking to amend Part 15 to establish regulations to permit wideband TLPR devices in the band 77-81 GHz.

Ohmart/VEGA Corporation and VEGA Grieshaber KG support both the Waiver Request and Petition for Rulemaking filed by Siemens provided additional information is taken into consideration. First, the waiver should be granted for the entire frequency 77-81 GHz, as specified in the Petition and secondly, the modulation of the devices under the waiver should include Pulse techniques, as well as FMCW. The increased provisions will allow more than one manufacturer of TLPR devices to enter the US market with an increase benefit to US industry and consumers, without an increased interference potential, as discussed in these comments.

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OHMART-VEGA COMMENTS TO SIEMENS WAIVER REQUEST AND PETITION FOR RULEMAKING

Ohmart/VEGA Corporation of Cincinnati, Ohio and VEGA Grieshaber KG of Schiltach, Germany (hereinafter Ohmart/VEGA) are pleased to file comments supporting both the subject Waiver Request and Petition for

Rulemaking filed by Siemens Milltronics Process Instruments, Inc. to permit the immediate marketing of Tank Level Probing Radar (TLPR) devices in the 78-81 GHz frequency band. However, Ohmart/Vega believes that Siemens Waiver Request is unnecessarily restrictive and that the waiver should permit TLPR devices to operate with any type of modulation (including Pulse Radar) in the entire frequency range of 77-81 GHz for the reasons given below.

I. Background

(A) Siemens' waiver request and petition

The subject request for waiver and petition for rulemaking were filed by Siemens pursuant to Section 1.3 of the FCC rules on November 7, 2006 and placed on Public Notice for comments on December 6, 2006 with comments and reply comment due by January 5, 2007 and January 22, 2007, respectively. The Request asked for waiver of Section 15.205(a) of the FCC Rules and Regulations. Section 15.205(a) limits emissions in the 78-79 GHz band to spurious emissions only. Siemens' request would permit certification and marketing of a frequency modulated continuous wave RF carrier (FMCW) tank level probe radar (TLPR) in the band 78-79 GHz for use in closed metal and reinforced concrete material storage tanks under the provisions of Section 15.209(a) of the Commission's rules. Bench testing and *in situ* measurements of emissions outside the tank would be required in order to determine compliance with the general emissions limits in Section

15.209(a). Concurrently, Siemens filed a petition for rulemaking to amend Part 15 to establish regulations and compliance procedures to permit wideband TLPR devices in the band 77-81 GHz.

(B) Ohmart/VEGA and VEGA Grieshaber KG

VEGA was established in 1959 with a focus on level measurement. In 1991, VEGA introduced the first viable pulse TLPR to the market. From the 1970's to 1991, only FMCW TLPR instruments were available on the market. Since that time, VEGA has been the leader in the development of pulse TLPR instruments as shown by the following achievements:

1997 First TLPR powered from a 4-20mA process loop

1999 First K-band pulse TLPR for level measurement

1999 Became world leaders in TLPR unit volume – retained since 1999

2003 plics® radar developed, world's smallest TLPR system

2004 First high sensitivity pulse TLPR developed for solids measurements

Ohmart/VEGA was founded in 1950 by Philip Ohmart as the Ohmart Corporation. Philip Ohmart invented process measurement using low level radioactive isotopes. In 1995, Ohmart Corporation partnered with VEGA to distribute VEGA product in North America. After several years of steady growth, VEGA purchased half of the shares of Ohmart Corporation, with Ohmart changing its name to Ohmart/VEGA Corporation. Ohmart/VEGA

has been a leader in solving problems for industry and government through our expertise and specialization of the VEGA pulse radar products. Ohmart/VEGA produces TLPR systems at its factory in Cincinnati, Ohio.

VEGA and Ohmart/VEGA have installed of over 100,000 pulse TLPR devices operating below 38 GHz worldwide with approximately 30,000 certified TLPR instruments installed in the United States. The pulse TLPR technology is a very important element of our business and has proven extremely successful in solving the level measurement problems for our customers. The TLPR technology continues to develop with different frequencies showing advantages for various industries and applications.

(C) **Benefits of TLPR devices to industry**

TLPR devices have proven very beneficial to industry. The main advantages are that it is non-contact, unaffected by most process and environmental conditions, and measures from the top of the vessel. Based on the pure electronic working principle no moving parts are used and no maintenance is necessary. Of the two types, pulse and FMCW, pulse is now the dominant method of level measurement in industry, with a installed basis of more than 50% in terms of unit volume compared to FMCW. Pulse TLPR devices has proved beneficial to industry due to the fact that it was the first radar technology operating with significantly lower power than any other radar technology. The small power consumption allows for pulse radar to operate on power derived from the industry standard 4-20mA signal loop,

eliminating the need for a separate source of power. Most FMCW TLPR devices still typically require today external power in addition to the 4-20 mA signal loop, which dramatically increases the installation costs for customers. Pulse radar TLPR devices have also proven to be able to measure level in very difficult applications with low conductivity liquids, high degree of turbulence, foam, and other complicating factors. Due to less amount of effort for electronic and software signal conditioning TLPR devices are also significantly smaller in size and lighter in weight than other radar devices, easing transport and installation by the customer.

(D) Benefits of TLPR Devices to Government

TLPR devices have proven very beneficial to the government. Below is a list of the major government users of TLPR devices:

i) The US Navy

The US Navy has installed approximately 5000 pulse radar level systems over the past seven years. To date, the Navy has only approved pulse TLPR systems for shipboard use; there are no FMCW TLPR types currently approved for use on Navy ships. The US Navy sees great benefit to the radar level sensors as they provide a measurement of fuel (both propulsion fuel on conventional ships and jet fuel on nuclear carriers), ballast, potable water, and other liquids without needing to enter or modify tanks. Pulse TLPR has replaced float level systems that were unreliable

during deployment and also required significant maintenance and repair. For just the carrier fleet, it is estimated that the switch from float level devices to pulse TLPR will save the Navy close to $50 million, as well as provide a level measurement that is reliable and trusted by the ship's personnel. Cost savings and some reference information on the Navy use of pulse TLPR are available.

ii) US Department of Energy

The US Department of Energy has a substantial installed base of pulse TLPR instruments at many sites, with major installations at the Savannah River and Oak Ridge sites. In addition, pulse TLPR will be the primary method of measuring level on both high level and low level radioactive waste at the Hanford River Protection Project. Pulse TLPR provides a specific benefit to the measurement of radioactive liquids as this technology allows the use of curved pipes as waveguides. Waveguide pipes are curved through containment and shielding walls, allowing measurement of the radioactive liquid with no electronics exposed to the high radiation environment. Previous methods of level measurement were unreliable, requiring DOE personnel to enter radioactive areas to repair and maintain the level measurement devices. With pulse TLPR this exposure is significantly reduced.

iii) US Army TACOM

The US Army has also deployed pulse TLPR devices for their new series of tanker trucks, the M967 and M969. Pulse TLPR provides level measurement which has proven reliable in harsh military environments. Other level measurement systems were not able to handle the extremes of temperature or rough environmental conditions required by the Army for their tanker trucks. The use of pulse TLPR allows the soldier to trust the level measurement device and not climb the tanker to manually verify the measurement.

iv) Hydrologic Radar

Pulse radar is also now beginning to be deployed by the USGS Hydrologic Instrumentation Facility, Army Corps of Engineers, NOAA, along with other state and federal agencies for the measurement of water levels in both coastal areas and inland waterways. The applications include dam level control, tsunami warning, irrigation monitoring, flood control and others. The small size and low power consumption of pulse radar is driving the interest from these government entities as a lower cost and more reliable hydrologic measurement device than the older technologies currently deployed. These devices are certified to operate at 6.3 GHz and 26 GHz for hydrologic applications.

II. Argument for new TLPR device rules

The use of radar signals (electromagnetic waves) for level measurement is state-of-the-art technology. No other measuring method is more universally applicable than radar. The basic advantage of the radar technology is its very accurate non-contact measurement of levels, regardless of temperature and pressure of the product to be measured and of the sensor environment. In comparison to non-contact ultrasonic or laser technology, the radar technology is less sensitive to strong dust generation and air turbulences. Measuring distances from 1m to 100 m without adaptation of the microwave power can be implemented due to the low damping of the radar signals in the air. The technological development in radar technique, material research and microprocessor technique over the last 20 years enables the production of cost-efficient sensor versions, which are suitable for virtually all applications.

For a multitude of applications, the radar technology is very often the most useful solution due to its technical advantages and economical efficiency. The radar level measuring technique is very often the only practicable solution, especially for applications in open vessels or non surrounded areas, e.g. in rivers, streams, lakes and dams as well as wave measurement on- and offshore. These measurements are of great importance to protect people and capital from natural disasters. Radar sensors are also the only economical solution for applications in vessels which cannot be

completely closed due to their size, as e.g. in case of material heaps (coal, ore) or in the building industry (gravel, crushed stones, stones).

In addition storage tanks of highly explosive materials are provided with floating roofs to avoid generation of explosive gases. The levels are detected outside the floating roofs in open standpipes or by measurements onto the floating roof. The coating of the complete measuring distance is inefficient in respect to the tank size (diameter up to 40 m, height up to 20 m).

Another range of applications for radar level sensors outside of closed, metallic vessels, are all vessels storing materials which corrode metals and finally the vessel itself. To protect people and capital non-metallic vessel materials are used which can be penetrated by the microwaves, as e.g. glass reactors in the chemical industry or plastic vessels for harmful substance filtration of industrial waste gases.

Other processes may cause contamination of the product to be measured. The levels of high-purity materials in the semi-conductor production must be measured through the plastic vessel from the outside.

For all these radar level measuring applications there is an increased demand worldwide. Due to the external dimensions of these applications the average number of measurement loops per area unit is essentially lower than for applications in closed vessels.

The higher frequency TLPR devices proposed in this request for waiver and rule change offer very important benefits to the users of these devices. Higher frequency devices allow for much smaller antenna systems, allowing for the deployment of TLPR in very small process connections. These small process connections are often found in growing industries with a need for reliable level measurement, such as biotechnology, semiconductor, and nano-materials. These industries would benefit greatly from the advantages of higher frequency TLPR devices, if available in the smaller process connection sizes. Higher frequencies also allow for a more focused microwave signal to be emitted by the TLPR device. This has some significant advantages in allowing a more reliable and secure signal reception in some difficult applications.

III. Ohmart/VEGA comments to Siemens' waiver request

As mentioned above, Ohmart/VEGA support the waiver request, but believe the waiver is too restrictive by allowing only one type of TLPR device. We believe that the waiver should allow any type of modulation and should coincide with the frequency bands (77-81 GHz) and technical requirements specified in the Siemens' Petition. There is no apparent reason to limit the modulation type or frequency range of the waiver since it would preclude viable devices with greater measurement level accuracy and other important benefits to the users of these devices such as smaller process connections and

tighter focusing of the microwave signal. Until the related rulemaking proceeding is complete, we agree with Siemens that the waiver should be limited to metal and concrete reinforced tanks and granted immediately.

Over the last 3 years, a group of TLPR manufacturers have been working together with ETSI on a European standard for TLPR devices. Siemens and VEGA Grieshaber KG are members of this group beside other TLPR manufactures. All companies worked together to implement all interests from the market side into a new standard in consideration of all existing European frequency regulations and government laws. This new standard EN 302 372 is already approved but not published yet. It covers the FMCW radar technology as well as to pulse radar technology. The work of this industry group was a very productive process and helped the authorities to get a standard in a reasonable time which covers all TLPR application in closed metal and reinforced concrete material vessels.

For the reasons given above, Ohmart/VEGA believes adoption of the waiver, modified as mentioned above, will serve the public interest since many of these devices at lower frequencies are already in operation by many industry and governmental users. The higher frequency TLPR devices will allow more applications due to greater level measuring accuracy. We agree with Siemens that there is minuscule potential interference to existing users of the 77-81 GHz bands for the reasons cited in the Siemens petition. The primary reason being TLPR devices are typically operated with the radar

pointing downwards inside an enclosed tank in commercial and industrial areas. In addition, these devices are subject to operate under the general conditions of operation in Section 15.5 of the FCC Rules, which essentially state that all Part 15 devices operate on a sufferance basis.

IV. Summary

Ohmart/Vega believes that prompt granting of the Siemens's waiver, modified as mentioned above, will bring to market a technology that gives industry a means to improve manufacturing processes and lower costs. In view of the negligible interference potential of TLPR devices, operating under the proposed technical and operational requirements, we believe the impact to existing users of the spectrum above 38 GHz is remote, at best. For these reasons, we believe it is the public interest to grant the modified waiver and initiate the rulemaking proceeding.

Respectively submitted,

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